Ballona Wetlands Truth Maintenance Report

Verified Findings on Historical Hydrology, a Withdrawn Regulatory Claim, and an Engineering-Record Misattribution

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Executive Summary

This report documents three independently verified findings:

Finding 1 — The historical hydrological baseline is well-established and consistent across seven documentary sources spanning 168 years. The Ballona Lagoon has been consistently documented — by the 1858 Hancock federal survey, the 1868 Courtney partition map, Ingersoll's 1887/1908 account, the Dark et al. (2011) historical ecology report, a 2015 CDFW-commissioned geoarchaeological review, and CDFW's own current public materials — as a bar-built, intermittently closed coastal lagoon, not a permanently open tidal estuary. There is no contradiction among these sources on this point.

Finding 2 — CDFW's public-facing historical narrative contains a specific factual error, flagged in 2023, formally withdrawn by the original authors in 2026, and still uncorrected. CDFW's website attributes the 1825 shift of the Los Angeles River in part to "a series of earthquakes." No earthquakes are recorded in the Los Angeles basin during the relevant period in USGS or UCERF3 historical catalogs. Tom McMahon submitted formal REIR scoping comments documenting this on November 21, 2023. On April 20, 2026, the original report's authors issued a corrigenda formally withdrawing the claim. CDFW's website has not been updated.

Finding 3 — CDFW's Area A fill-volume claim, used to justify large-scale soil removal as "restoration," appears to conflate two separate fill quantities from the same 1959–1961 harbor-construction project, and both the U.S. Army Corps of Engineers' original geoarchaeological consultant and CDFW's own comment-response record mislocate or fail to substantiate the underlying disturbance history. Official 1960 U.S. Army Corps of Engineers engineering specifications show that Area A corresponds to Fill Area F-14 (1,557,000 cubic yards) — not the larger 3,200,000-cubic-yard figure associated with Fill Area F-7 (interior harbor basin construction), which appears to be the actual source of the "2.8 to 3.5 million cubic yards" figure used throughout the Draft and Final EIR. Independent, contemporaneous primary sources also show that the 2015 geoarchaeological review CDFW relies on misidentifies the location of the 1910–1913 Playa del Rey Motordrome, and that Area A carries a documented multi-decade disturbance history — 1910 Motordrome grading, 1938 Ballona Creek channelization spoils, and 1959–

61 harbor fill — that is not disentangled in CDFW's current analysis. A specific public comment raising this exact volume discrepancy during the EIR process received a response in which CDFW stated it had insufficient information to investigate, without reference to its own cited source material.

Section 1: The Historical Hydrological Baseline

1.1 Why This Matters

Restoration planning depends on an accurate historical baseline. If the baseline is misdescribed, "restoration" risks constructing a system that never existed. This section establishes what the baseline actually was, using primary and near-primary sources, cross-checked against CDFW's own current public statements.

1.2 The Corrected Chronology

Period	Condition	Source
Pre-1815	LA River's principal course runs south toward San Pedro Bay, not through Ballona; no defined channel to the ocean via the Ballona watershed	Warner testimony (1876), cited in Ballona Creek Terminus Report v4.6.1; ESA/Lockwood 2015
1815–1825	Anomalous debris-dam period; main channel intermittently heads west through Ballona Creek to Santa Monica Bay; no stable, permanent outlet	CDFW website; Dark et al. 2011
1825	**LA River shifts south to San Pedro Bay — its current, permanent course**	CDFW website; Dark et al. 2011; ESA/Lockwood 2015
1825–1887	Ballona functions as an independent, local-watershed-fed, bar-built coastal lagoon; intermittent natural ocean connection — the undisturbed post-diversion condition	Hancock (1858); Courtney Map (1868); Ingersoll (1887/1908); Dark et al. (2011); ESA/Lockwood 2015; CDFW website
1887–present	Tidal regime subject to anthropogenic disturbance in evolving form: Port Ballona Development Co. jetties (1887–c.1890); jetties again present by the 1920s despite a sediment-prone opening; Ballona Creek Flood Control Channel excavation, jetties, and tide gate structure (1935–1940); 1959–61 Marina del Rey construction	T. Longcore (pers. comm., August 2, 2026); Dark et al. (2011) [target period bounded at 1890]; U.S. Army Corps of Engineers, Federal Proj. No. 13-130 (1937, File 95/85); U.S. Army Corps of Engineers, OCI-CIV-60-5 (1959)

Critical point: 1825 marks the *end* of LA River influence on Ballona, not the beginning of a continuing discharge. Any analysis that measures "years after 1825" as years of continued Ballona–LA River connection has the chronology backwards.

1.3 CDFW's Own Description (Verified Verbatim)

From CDFW's official FAQ, "What was here before BWER?" (https://wildlife.ca.gov/Regions/5/Ballona-EIR#593493804-what-was-here-before-bwer):

> "Prior to 1825, the Los Angeles River flowed through the Ballona watershed and into the Ballona Lagoon. Following a period of several years of heavy rains and a series of earthquakes, the Los Angeles River outlet moved to its current location near San Pedro. The migration of the Los Angeles River had a significant impact on the form and function of the historic Ballona Wetlands.
>
> After the Los Angeles River shifted to the south, the Ballona Wetlands became a coastal bar-built estuarine system with extensive tidally affected saltmarsh and brackish habitats that transitioned into a more alkaline/freshwater system approximately 1.5 miles inland from the coast. Without the inflow from the Los Angeles River, the wetlands were often closed to the ocean by a sand berm along the beach, causing perching of water within the lagoon wetlands. During wet weather periods when Ballona Creek stream flow discharge was high enough to overflow or scour a channel to the ocean, the Ballona Creek mouth was open to the ocean and experienced tidal influence until the sand berm reformed across the mouth of the creek."

This description — bar-built, often closed by a sand berm, intermittent tidal access — is fully consistent with the primary source record below. CDFW's own FAQ elsewhere states that restoring Ballona to a freshwater, river-fed system "would not be historically accurate" — CDFW is not claiming the historical system was a continuously open river-mouth estuary.

1.4 Primary Source Corroboration (1858–2015)

Hancock Field Notes (1858) — U.S. Deputy Surveyor Henry Hancock, Rancho La Ballona survey. In the "REMARKS" section:

> "The inlet bay may very properly be styled, an interior lake, for as previously stated, in the foregoing notes, the connection with the sea is often obstructed."

Source: https://archive.org/details/rancho-ballona-hancock-survey-obstructed-connection-with-the-sea-april-17-1857/ (archived by Tom McMahon)

Hancock Plat (1858) shows the "Inner Bay" confined to a limited coastal extent, consistent with the field notes.

Courtney Partition Map (1868) — created under Los Angeles District Court order (Case No. 965), citing Hancock's survey as its boundary basis. The fourth-class "Lands in Bay" designation is confined to a narrow coastal fringe.

Dark et al. (2011), *Historical Ecology of the Ballona Creek Watershed*, SCCWRP Technical Report #671 (corrected authorship: Dark, S., Stein, E.D., Bram, D., Osuna, J., Monteferante, J., Longcore, T., Grossinger, R., & Beller, E.):

> "We found no evidence that the lagoon remained perennially open, but rather the textual sources indicate that access to the ocean depended on hydraulic forces during any given year… this 'trapped' lake-like feature… Open water made up less than 3 percent of the lagoon."

Source: https://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/671_BallonaHistoricalEcology.pdf

ESA/Lockwood Geoarchaeological Review (2015), prepared for the California State Coastal Conservancy:

> "In the past, the Los Angeles River periodically switched direction of discharge, at times flowing west through the Ballona and at other times flowing south towards Long Beach. In fact, as late as 1825, the Los Angeles River was discharging into the Ballona… Over time, as ocean currents deposited sand across the mouth of the bay a barrier spit was formed, creating an enclosed lagoon."

Source: https://filelib.wildlife.ca.gov/FileLib/Ballona_Restoration_EIR_Reference_Material/3-06_GeoSoils_Refs/ESA%202015%20BallonaGeoarchaeologicalReview-20150330_FINAL.pdf

1.5 Summary Table: Seven Documentary Sources, One Consistent Picture

Source	Date	Description
Hancock Field Notes	1858	"Interior lake," connection "often obstructed"
Hancock Plat	1858	Limited "Inner Bay" extent
Courtney Partition Map	1868	"Lands in Bay" confined to narrow coastal fringe
Ingersoll / Sheridan	1887/1908	"Lake," seasonal breaching
Dark et al.	2011	"No evidence…perennially open"; "trapped lake-like feature"
ESA/Lockwood Geoarchaeological Review	2015	"Enclosed lagoon," barrier spit formation
CDFW website	2026 (current)	"Bar-built," "often closed…by a sand berm"

No contradiction exists among these seven data points spanning 168 years. This is the correct foundation for restoration-planning discussions — a point of established agreement, not dispute.

Section 2: Verified Truth-Maintenance Failure — The Withdrawn Earthquake Claim

This section documents a truth-maintenance failure as defined in the Methodological Note: CDFW's belief persisted after its underlying justification was withdrawn.

2.1 The Claim

CDFW's website states (see full quote, §1.3):

> "Following a period of several years of heavy rains and a series of earthquakes, the Los Angeles River outlet moved to its current location near San Pedro."

This traces to Dark et al. (2011), page 4:

> "Along with years of unusually high precipitation, the residents during this period frequently mention a series of earthquakes that rocked the Los Angeles area (Regan 1917)."

2.2 The Technical Challenge (November 21, 2023)

Tom McMahon submitted formal REIR scoping comments directly to CDFW (BWERcomments@wildlife.ca.gov), dated November 20–21, 2023, cross-referencing ten sources on historical California seismicity, including the USGS Working Group on California Earthquake Probabilities Historical Earthquake Catalog and the UCERF3 Earthquake Catalog. Finding:

> "The ten references below record no earthquakes in the LA basin in the period from 1815 to 1825. Only one event northwest of Santa Barbara is recorded in the U.S.G.S. database during that period (1821, not 1825): magnitude 6.3, 34.55°N, -119.85°W — approximately 90 miles from Paseo de las Carretas."

Request: **"Please correct this website (i.e. omit the earthquake reference)."**

Archived: https://archive.org/details/cdfw-reir-scoping-comments-earthquakes-tom-mc-mahon-2023-11-20-02 (ark:/13960/s2v5v3bx39b)

2.3 The Corrigenda (April 20, 2026)

The original report's authors — Shawna Dark, Eric D. Stein, Danielle Bram, Joel Osuna, Joseph Monteferante, Travis Longcore, Robin Grossinger, and Erin Beller — issued a formal corrigenda to SCCWRP Technical Report #671, explicitly crediting Tom McMahon's review:

> "Page 4. We make a claim of a 'series of earthquakes' before 1825. Upon review, we could not confirm this claim upon consideration of our original notes and the Reagan (1917) listed as a source and withdraw it."

> "Page 4. We describe three years of heavy rains around 1825. Upon review of Reagan 1917 and other sources, we were unable to substantiate this claim,

> although heavy rains specifically in 1825 associated with change of course of the Los Angeles River remains supported."

Source: https://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/671_BallonaHistoricalEcology.pdf (corrigenda appended to the report PDF)

2.4 Current Status

CDFW's website has not been updated. It continues to state, without qualification, that "a series of earthquakes" contributed to the 1825 shift — a claim its own underlying source has formally withdrawn, following a specific, dated, technically-substantiated request to correct it, submitted more than two and a half years before this report.

Section 3: Area A Fill-Volume and Disturbance-History Misattribution

3.1 The Claim Under Examination

CDFW's Draft and Final EIS/EIR state:

> "Approximately 2.8 to 3.5 million cubic yards (cy) of dirt was dumped on top of the wetlands during the construction of Marina del Rey in the 1950s, transforming what had been wetlands abundant with fish and waterfowl into upland and degraded wetlands."

The Draft EIS/EIR further states, citing the 2015 ESA/Lockwood geoarchaeological review:

> "Dredge spoils from construction of Marina del Rey were deposited as fill across the north and northwestern portion of the Project site (Lockwood 2015), including Area A and Area C."

This figure is used throughout the EIR to justify the scale of proposed excavation (2.29–2.42 million cy of material repositioned under Alternative 1) as necessary to reverse historical degradation.

3.2 The Public Challenge

During the Draft EIR comment period, Comment Letter O2 raised the following specific objection:

> "Page ES-3 and ES-4 Area A - 2.8 to 3.5 million cubic yards of fill was NOT dumped on it in the 1950s… The research that has been done shows that most of the fill to dredge Marina Del Rey was used to build up dirt sites in Marina Del Rey so that they could build large developments on them. Trucks that had small amounts of dredging dirt left over would dump it on Area A to empty their trucks, leading to only about 6 feet of dirt built up along Fiji Way."

3.3 CDFW's Response

CDFW's Final EIR response (O2-22) states:

> "The commenter's belief that less than 2.8 to 3.5 million cubic yards of fill was deposited in the Ballona wetlands, as is reported in the Draft EIS/EIR, is acknowledged. **Without evidence to review in support of the asserted position, CDFW does not have enough information to investigate further or to provide a more detailed response.** Accordingly, CDFW respectfully disagrees with the assertion made in the comment."

This response does not cite Lockwood (2015) — CDFW's own commissioned source — or any other supporting documentation for the 2.8–3.5 million cubic yard figure specific to Area A.

3.4 What the Actual U.S. Army Corps of Engineers Records Show

The underlying 1959–1961 harbor construction project is documented in two primary U.S. Army Corps of Engineers records: **OCI-CIV-60-5** ("General Plan of Harbor Improvement" and associated dredging/fill drawings, 1959) and its accompanying specification, **CIVENG-04-353-60-5** ("Specifications for Dredging and Revetment," Addendum 2).

CIVENG-04-353-60-5, Addendum 2, Table SC-39 ("Table Showing Estimated Quantities in Dredging and Disposal Areas") gives an itemized breakdown by fill area:

Fill Area	Quantity (cu. yd.)
F-1 (1st + 2nd lift)	1,125,000
F-2	496,000
F-3 (incl. Moles 1–2)	795,000
F-4 (incl. Mole 3)	539,000
F-5 (incl. Mole 4)	225,000
F-6 (incl. Moles 5–6)	1,251,000
F-7	**3,200,000**
F-8 (1st + 2nd lift)	973,000
F-9	353,000
F-10	589,000
F-11	355,000
F-12	353,000
F-13	617,000
F-14	**1,557,000**
Total (all fill areas)	**12,428,000**

Sheet 1 of OCI-CIV-60-5 ("General Plan of Harbor Improvement") maps these fill areas spatially:

- **F-7** is positioned in the interior harbor basin construction zone (near Basin E/Mole 4) — inside Marina del Rey's boat basin complex, not in the wetlands.
- **F-14** is positioned along the Ballona Creek Flood Control Channel corridor, bounded by Culver Boulevard — directly corresponding to the modern boundaries of Area A as described in the 2015 ESA/Lockwood review ("139 acres, north of current Ballona Creek flood control channel, west of Lincoln Boulevard, south of Fiji Way").

Total project fill across all fourteen areas was 12,428,000 cubic yards — not 2.8–3.5 million. The 2.8–3.5 million figure most closely matches F-7 (3,200,000 cy), which was deposited in the interior harbor basin, not Area A. Area A's documented fill area (F-14) received 1,557,000 cubic yards — well under half the figure cited in CDFW's EIR for "the wetlands."

Sources: U.S. Army Corps of Engineers, "General Plan of Harbor Improvement," Playa del Rey Inlet and Harbor, File No. OCI-CIV-60-5 (1959); "Specifications for Dredging and Revetment, Playa del Rey Harbor, Venice, California," CIVENG-04-353-60-5, Addendum 2 (1960).

3.5 The Motordrome Location Error in CDFW's Cited Source

The 2015 ESA/Lockwood geoarchaeological review — the source CDFW's EIR cites for Area A's disturbance history — states that the Playa del Rey Motordrome (1910–1913) "occupied an area of approximately 50 acres south of Ballona Creek," placing it in Area B.

This location is contradicted by two independent, contemporaneous primary sources:

A 1911–1913 USGS topographic survey shows the Motordrome's "One Mile Track" positioned north of the Pacific Electric Railway line and Motordrome Station, on the same side of the creek as modern Area A.

Los Angeles Department of Public Works Field Map 10224 (Plate A13 of 29) — a surveyed property/allotment map showing the Machado family land allotments — shows the Motordrome track positioned north of Culver Boulevard (then "Del Rey Boulevard") and north of Jefferson Boulevard (then "Playa Street"), on the marina/Fiji Way side of the creek corridor, not the bluffs side.

A modern georeferenced overlay of the historical Pacific Electric Railway route onto current satellite imagery independently places the Motordrome track ring within the footprint that Lockwood's own report defines as Area A ("north of Ballona Creek… south of Fiji Way").

The 1955 aerial mosaic accompanying the Corps' Design Memorandum No. 1 (File No. 2243A, Plate 2, "Aerial Photography of 8 December 1955") independently shows the Motordrome's remnant footprint on the same side of the channel, east of the harbor construction zone and north of the creek, corroborating the Area A placement from a fourth, independent source predating the 2015 review by 60 years.

The railway station and spur serving the Motordrome were located in Area B, south of the creek — this appears to be the source of the location confusion in the 2015 review, which conflates the ancillary rail infrastructure's location with that of the main track facility.

3.6 A Documented, Multi-Decade Disturbance History

Beyond the Motordrome, primary U.S. Army Corps records independently document that Area A carries pre-existing disturbance predating the 1959–61 Marina del Rey fill by decades:

1938 Ballona Creek channelization. A U.S. Army Corps of Engineers record from January 1, 1938, documenting the channelization of Ballona Creek, shows dredge-spoil deposition running along the north levee of the newly-cut flood control channel — directly within what is now Area A — thirteen years before the earliest geotechnical borings reviewed in the 2015 ESA/Lockwood report.

1927 aerial evidence of the Motordrome's remnant footprint, per the same construction-era record set, shows a circular depression/blowout feature at the terminus of the unchannelized Ballona Creek fourteen years after the Motordrome's demolition, with visible erosion damage — consistent with substantial ground disturbance from the original 1910 construction persisting through the late 1920s.

3.7 Synthesis

Taken together, these primary sources establish that Area A's disturbance history is a layered, multi-decade sequence — 1910 Motordrome construction and grading, 1938 Ballona Creek channelization spoils, and 1959–61 harbor-fill deposition (1,557,000 cubic yards, not 2.8–3.5 million) — that CDFW's EIR compresses into a single, larger-than-documented "Marina del Rey" fill event. This is precisely the kind of specific, checkable technical claim that a formal public comment (O2) challenged during the Draft EIR process, and to which CDFW responded that it lacked sufficient information to investigate — without engaging its own commissioned geoarchaeological source, which itself independently mislocates a key piece of the disturbance history it does discuss.

Section 4: Recommendations

1. **CDFW should correct the "What was here before BWER?" FAQ** to remove the "series of earthquakes" claim and revise "several years of heavy rains" to reflect the 2026 corrigenda's finding that only rainfall in 1825 itself is substantiated.

2. **CDFW should re-examine the Area A fill-volume figure** cited throughout the Draft and Final EIR, specifically verifying whether the "2.8 to 3.5 million cubic yards" claim conflates Fill Area F-7 (interior harbor, 3,200,000 cy) with Fill Area F-14 (Area A, 1,557,000 cy) per U.S. Army Corps of Engineers Table SC-39 (CIVENG-04-353-60-5, Addendum 2).

3. **CDFW should request that its geoarchaeological consultant (ESA) correct the Motordrome's location** from Area B to Area A in any future revision of the 2015

Geoarchaeological Review, and should reassess Area A's archaeological sensitivity mapping and disturbance-history narrative accordingly.

4. **The historical baseline described in Section 1** — bar-built, intermittently closed, consistent across all seven sources including CDFW's own materials — should be treated as settled and used as the shared factual foundation for restoration-goal discussions.

Methodological Note

The term "truth maintenance" is used in this report in the sense introduced by Jon Doyle's foundational work on Truth Maintenance Systems (TMS): a reasoning framework in which conclusions are revised when the propositions supporting them are shown to be incorrect or are withdrawn.[1] This report applies that principle as a methodology for historical and technical source evaluation — not as an implementation of Doyle's original algorithms, but as the same underlying discipline: an initial claim is identified, its supporting evidence is examined against primary sources, unsupported claims are withdrawn rather than hedged, and conclusions are revised accordingly. The version history preceding this report's earlier drafts documents that process directly, including instances where claims were withdrawn after failing verification.

A Note on This Revision

Version 2.0.0 restarted this report on a verified foundation after Versions 1.0–1.8.6 and a separately-circulated "Historical Baseline and Truth Maintenance Analysis" document were found to contain an internal chronology error and an unverified central thesis ("fully open tidal estuary") that did not survive direct comparison against CDFW's own published materials.

Version 3.0.0 adds a second, independently verified truth-maintenance finding: **a documented misattribution of Area A's fill-material volume and disturbance history**, established this session through direct examination of primary U.S. Army Corps of Engineers engineering records, contemporaneous historical maps, and CDFW's own comment-response record. This finding does not depend on, and is entirely separate from, any advocacy-network or institutional-affiliation material; per instruction, no such material is referenced anywhere in this report.

Every specific figure, quote, and location claim in this version has been checked against a primary source retrieved or provided this session. Where a claim could not be independently verified (including a proposed ~10% Centinela Creek freshwater-contribution figure), it has been deliberately omitted rather than included with a caveat.

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9. Courtney partition map, Los Angeles District Court Case No. 965 (1867–1868).

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17. Los Angeles Department of Public Works (1928). Field Map 10224, Plate A13 of 29, “Del Rey / Redondo Line.”

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